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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/759,457 | 01/16/2004 | Kwon Hong | 29926/38094A | 7723 |

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EXAMINER

THOMAS, TONIAE M

ART UNIT PAPER NUMBER

2822

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EL

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/759,457 | HONG, KWON | |
| | Examiner | Art Unit | |
| | Toniae M. Thomas | 2822 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/236,311.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>04/23/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is a first Office action on Application Serial No. 10/759,457, which is a divisional of Application Serial No. 10/236,311 filed on 06 September 2002, now US Patent No. 6,689,623 B2.
2. The preliminary amendment filed on 16 January 2004 cancelled claims 1-7. Currently, claims 8-10 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Joo (US 5,879,957).

Joo discloses a capacitor (see figs. 8A-8F and accompanying text). The capacitor comprises: a lower electrode formed on a substrate 54, wherein the lower electrode includes a metal pattern 45a (fig. 8E and col. 6, lines 3-4), and a layer 47a, 50 that comprises Pt covering an upper surface and sidewalls of the metal pattern (figs. 8E, 8F; col. 6, lines 9-10; and col. 6, lines 46-49), and wherein the metal pattern 45a is formed of a material capable of forming a conductive oxide (col. 6, lines 41-44); a dielectric layer 51 formed on the lower

electrode (fig. 8F and col. 6, lines 49); and an upper electrode 52 formed on the dielectric layer (fig. 8F and col. 6, lines 49-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joo in view of Hong et al. (US 6,451,666 B2).

Joo further discloses that the metal pattern 45a comprises Ru (col. 6, lines 3-4).

While Joo discloses a metal pattern 45a that comprises Ru, Joo lacks anticipation of a seed layer between the substrate and the metal pattern, the seed layer comprising Pt. The Hong et al. patent (Hong), on the other hand, teaches a seed layer 130 between a substrate 102 and a metal pattern 134 (Hong - fig. 1E). Hong discloses a capacitor (figs. 1A-1H and accompanying text), wherein the capacitor comprises a lower electrode 137 (fig. 1F and col. 3, lines 50-56), a dielectric layer 138 (fig. 1G and col. 3, lines 56-64), and an upper electrode 140 (fig. 1H and col. 4, lines 1-4), and the lower electrode comprises a metal pattern 134. The capacitor further comprises: a seed layer 130 (136) provided between the substrate and the metal pattern, wherein in

Art Unit: 2822

one preferred embodiment the seed layer may comprise Pt (figs. 1E, 1F, and col. 3, lines 8-13). The metal pattern, in turn, is provided on the seed layer 130 by an electroplating process (col. 3, lines 33-38).

Joo and Hong are from the same field of endeavor, fabrication methods for capacitors in semiconductor devices. Thus, the purpose for which Hong is relied upon would have been recognized in the pertinent prior art reference, Joo, by one of ordinary skill in the art at the time the invention was made.

As discussed above, the metal pattern 45a of Joo comprises Ru. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Joo by providing a seed layer between the substrate and the metal pattern, as taught by Hong, since providing a metal layer, such as Ru, in a semiconductor device by electroplating a seed layer with material comprising the metal is a known deposition technique commonly used in place of deposition techniques such as sputtering and chemical vapor deposition.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 a.m. to 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT
26 May 2005



Mary Wilczewski
Primary Examiner